

REMARKS

Claims 1-5 and 8-57 are pending, with claims 19-57 withdrawn from consideration. By this Amendment, claim 17 is cancelled, claims 1 and 18 are amended, and no new claims are added. Support for this Amendment can be found in the application as originally filed, and no new matter is believed to be introduced by way of this Amendment.

**Claim Rejections – 35 U.S.C. 102(b)/103 (Parthasarathy)**

In the Office Action mailed February 26, 2010, claims 1-5, 10 and 16 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,933,883 to Parthasarathy. Also, claims 1-5, and 13-16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parthasarathy in view of U.S. Patent No. 3,988,263 to Hansford; and claims 1-5, 10-12 and 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parthasarathy in view of U.S. Patent 6,255,358 to Singleton et al. In order to advance prosecution, Applicants have amended independent claim 1 to further clarify the presently claimed invention.

By way of this Amendment, Applicants have clarified the presently claimed invention in independent claim 1 as being directed to a catalyst for use in a Fischer-Tropsch synthesis reaction, the catalyst comprising cobalt supported on alumina, in which the catalyst average particle size is in the range 20 to 100  $\mu\text{m}$ ; the specific surface area of the impregnated and calcined catalyst particles is greater than 120  $\text{m}^2/\text{g}$ ; the average pore size of the impregnated and calcined catalyst is at least 90Å (9nm); the pore volume of the impregnated and calcined catalyst is at least 0.45  $\text{cm}^3/\text{g}$ , and the cobalt content of the catalyst is from 10 to 40% by weight.

Applicants respectfully assert that all the limitations of independent claim 1 as amended are not expressly or inherently described in Parthasarathy. Parthasarathy is directed to a

methanation reaction (the conversion of carbon monoxide and hydrogen to methane and a water byproduct) in the presence of a catalyst consisting of nickel oxide and cobalt oxide in a ratio of 1 to 1.5. The final methanation catalyst in Parthasarathy contains 3 to 10 percent by weight of nickel and cobalt calculated as the metal, which is in the ratio of 1 to 1.5. (See Col. 1, lines 22-27, Col. 1, lines 48 to 52, Col. 2, line 67 to Col. 3, line 1 and claim 1.) In the examples, Parthasarathy discloses the methanation catalyst to contain less than 5% cobalt. (See Table 2.) Thus, Parthasarathy fails to expressly or inherently disclose, at least, a catalyst with the cobalt content being from 10 to 40% by weight, as included in the presently claimed invention of independent claim 1 as amended. Accordingly, independent claim 1 as amended is not anticipated by Parthasarathy, and Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 102(b).

Applicants also respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a), as a *prima facie* case of obviousness has not been established. With respect to dependent claims 17 and 18, the Office Action stated that Singleton teaches ~20-45 wt. % Co in catalysts, with a 20 wt. % Co value specifically taught. But, the Office Action fails to provide any articulated reasoning with some rationale underpinning to support the conclusion that it would be obvious to combine any such teachings of Singleton with the methanation catalyst of Parthasarathy. See MPEP § 4143.01(IV) (citing KSR Int'l Co. v. Teleflex Inc. requiring more than mere conclusory statement to support obviousness rejection). Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a) on this basis alone.

Moreover, there is no rational underpinning to support the proposed modification, as any such proposed modification changes the principal operation of Parthasarathy. The catalyst in Parthasarathy consists of nickel oxide and cobalt oxide in a nickel/cobalt ratio of 1 to 1.5 and the final methanation catalyst contains about 3 to 10 percent by weight of nickel and cobalt to be an effective catalyst. (See Col. 1, lines 22-27, Col. 1, lines 48 to 52, Col. 2, line 67 to Col. 3, line 1 and claim 1.) Modifying Parthasarathy to contain ~20-40 wt. % of cobalt would also result in the nickel content being 15-20% (1-1.5 nickel/cobalt ratio), which results in a total metal content of 35-40%. Not only is ~20-40% wt. % of cobalt directly contrary to the teachings of Parthasarathy, but a total metal content of 35-40% would require a substantial reconstruction and design of the catalyst. Moreover, Parthasarathy teaches away from such high metal contents and discloses that a concentration of 3 to 10 wt.% metal values, yields a very effective catalyst composition. Also, the presence of nickel in the methanation catalyst would render it quite unsuitable as a Fischer-Tropsch catalyst. In other words, modifying Parthasarathy with the teachings of Singleton can only be based upon inappropriate hindsight of Applicants' application and claimed invention.

Thus, a *prima facie* case of obviousness has not been established, and Applicants are not presenting additional arguments with respect to the patentability of the dependent claims, although Applicants do not acquiesce to any of the rejections and reserve the right to raise additional arguments with respect to the patentability of such claims. As all remaining pending claims depend directly or indirectly from one of the subject claims, Applicants respectfully request that the rejections under § 103 be withdrawn. Also, because a *prima facie* case of obviousness has not been established, Applicants do not comment further here on the suitability

of combining or modifying the cited references. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a).

**Claim Rejections – 35 U.S.C. 103 (Mulaskey)**

In the Office Action mailed February 26, 2010, claims 1-5, 8-12 and 16 were rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent 4,102,822 to Mulaskey, with claims 17-18 being rejected over Mulaskey in view of Singleton. In order to advance prosecution, Applicants have amended independent claim 1 to further clarify the presently claimed invention.

By way of this Amendment, Applicants have clarified the pending invention in independent claim 1 as being directed to a catalyst for use in a Fischer-Tropsch synthesis reaction, the catalyst comprising cobalt supported on alumina, in which the catalyst average particle size is in the range 20 to 100  $\mu\text{m}$ ; the specific surface area of the impregnated and calcined catalyst particles is greater than 120  $\text{m}^2/\text{g}$ ; the average pore size of the impregnated and calcined catalyst is at least 90 Å (9nm); the pore volume of the impregnated and calcined catalyst is at least 0.45  $\text{cm}^3/\text{g}$ , and the cobalt content of the catalyst is from 10 to 40% by weight.

Applicants respectfully assert that a *prima facie* case of obviousness has not been established. With respect to dependent claims 17 and 18, the Office Action states that Singleton teaches ~20-45 wt. % Co in catalysts, with a 20 wt. % Co value specifically taught. But, the Office Action fails to provide any articulated reasoning with some rationale underpinning to support the conclusion that it would be obvious to combine any such teachings of Singleton with the hydrocarbon hydroconversion catalyst of Mulaskey. See MPEP § 4143.01(IV) (citing KSR Int'l Co. v. Teleflex Inc. requiring more than mere conclusory statement to support obviousness

rejection). Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a) on this basis alone.

Moreover, the Office Action fails to establish that all limitations of the claimed invention are met after the proposed modification. Specifically, the Office Action admits the carrier characteristics in Mulaskey are measured prior to impregnation. Mulaskey teaches the carrier characteristics are not maintained after impregnation; but instead, “the particles will exhibit surface area, and pore volume characteristics which are roughly 5 to 30 percent below the corresponding values for the carrier used.” (Col. 4, lines 18-21.) Mulaskey also teaches that this observed 5-30% decrease in the carrier’s characteristics is dependent “upon the loading (0.1 to 30 parts per 100 parts of carrier) of the carrier with the cobalt phosphomolybdate.” (Col. 4, lines 16-18.) However, the Office Action fails to establish, much less provide any rational basis, that the carrier characteristics will similarly maintain a decrease of 5-30% when the cobalt content of the catalyst is modified to be 10 to 40% by weight.

Thus, a *prima facie* case of obviousness has not been established, as the cited references, individually or in combination, do not teach or suggest all of the features included in independent claim 1 as amended. If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, Applicants are not presenting additional arguments with respect to the patentability of the dependent claims, although Applicants do not acquiesce to any of the rejections and reserve the right to raise additional arguments with respect to the patentability of such claims. As all remaining pending claims depend directly or indirectly from one of the subject claims, Applicants respectfully request that the rejections under § 103 be withdrawn.

Also, because a *prima facie* case of obviousness has not been established, Applicants do not comment further here on the suitability of combining or modifying the cited references. Thus, Applicants respectfully request reconsideration and withdrawal of these rejections.

### **Conclusion**

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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